

# MuhlenkampMethods

*For the Intelligent Investor*

Answers to questions you may not even know you have.

## The Financial Aspects of Marcellus Shale Drilling for the Landowner

*This essay was originally published in 2013. Ron—investment manager, engineer, farmer, and landowner—addresses how drilling companies secure the right to bring natural gas to market within a land unit. He also discusses bonuses and royalties for the landowners.*

A couple of the folks who work at Muhlenkamp & Company own farms north and south of Pittsburgh. They've had "landmen" from drilling companies knock on their doors with leases in hand, so they've done some work to try to figure out what the Marcellus Shale under their land means to them. This is a summary of what we've learned from their experiences.

First, we've learned that the Marcellus Shale formation isn't the only rock formation with untapped natural gas reserves under their land—there is also the Upper Devonian Shale (above the Marcellus formation), and the much deeper Utica Shale. It is worth keeping these Shales in mind as you evaluate your land.

Second, we've learned a lot about how the drilling companies look at the Marcellus Shale gas in Pennsylvania and how they are likely to develop the resource. You've probably heard it said that there is enough gas in the Marcellus to supply America's needs for many years—that means the drilling companies are going to develop a plan to bring that gas to market. Their time horizon is 50-100 years, not five or 10 years. This is important to remember.

The first thing the drilling companies did when they started to understand the magnitude of the gas reserves in the Marcellus—and the economic viability of bringing it to the surface—was to contact the landowners and sign or renew gas leases, kind of a "land rush." After the leases were signed, the drilling companies did a bit of swapping among themselves to get large, contiguous blocks of land so they could minimize the infrastructure they would need to build to bring the gas to market; they were looking for efficiency. The signing and swapping continues, but the lion's share of it is probably over. It is entirely



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possible that the company you signed a lease with will not be the company that develops your gas. The drilling company might have sold your lease, or the company you signed with might have been bought by a larger company. (We are seeing a lot of that; for example, BHP has bought Petrohawk, Exxon has bought Phillips, etc.)

As a part of the plans for developing the shale gas resources (and consistent with the language in the leases), the drilling companies are organizing their leases into “units.” Typically, a unit is about a square mile (640 acres) in size. The leases we have seen are good for five years. Once drilling commences, the lease is “held by the production” from anywhere in the unit. Royalties are paid to the landowners based on the portion of the unit their land represents. Note: Royalties are usually paid on gross receipts, minus the cost of marketing and transportation. Pay attention to your statements when they arrive.

Here’s how it comes together:

- The drilling company signs a lease with the landowner, then buys and sells with other drilling companies to get nice, large, economical blocks of land that it will organize into units.
- In order to hold the lease, it will drill at least one well in the unit sometime in the first five years to hold all the leases in the unit.
- To get all the available gas out of a unit may require between six and 10 wells, but it may not drill those right away. (Remember, the drilling company has a 50-100 year time horizon. It doesn’t want to bring all that gas to market in 10 years, it wants to spread it out. So it will drill what it must in the first five years to hold the lease, and then drill for production over a much longer time period.)

Our guess is companies will start drilling for production near their existing processing facilities and pipelines, and expand from there over time.

*The bottom line for the landowner is to understand which unit (or units) their land is in, and to realize that, while a well in their unit is very likely to be drilled in the first five years to simply hold the lease, drilling for production may not happen for years. Dry holes may also be possible, though we haven’t heard of one in the area yet.*

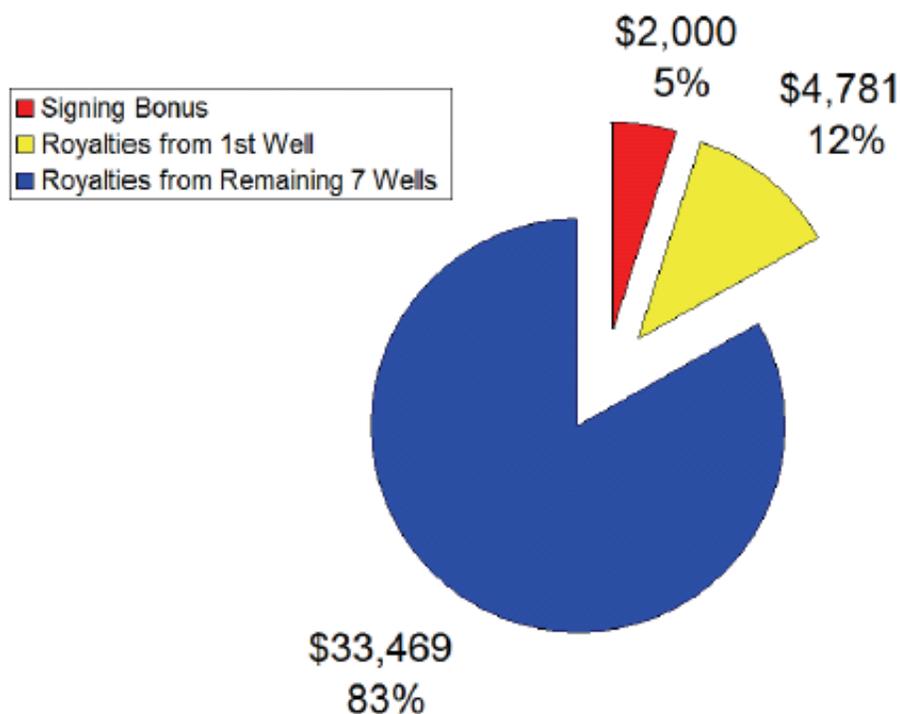


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The third thing we've done is to try to come up with an estimate of the total amount of money the landowner will see from this gas over the lifetime of the drilling effort. (This is not an estimate of earnings in any one year.) Using a typical Marcellus Shale dry gas pad in Southwestern Pennsylvania, we came up with \$30,000- \$40,000/acre to the landowners over the life of the wells in the unit. The gas income to the landowner arrives in three parts. We've depicted this graphically in Figure 1:

**Figure 1**

**Per Acre Estimate of Pre-Tax Cumulative Dollars Received by the Landowner Over the Life of a Typical Marcellus Shale Dry Gas Well in Southwestern Pennsylvania\***



\* Typical Marcellus Shale dry gas well pad as of 8/1/13: assumes 58 year well life, 80 acre spacing, 6 Bcfe EUR (Estimated Ultimate Recovery) per well, 8 wells total, \$4/MMBtu Dry Gas Price.

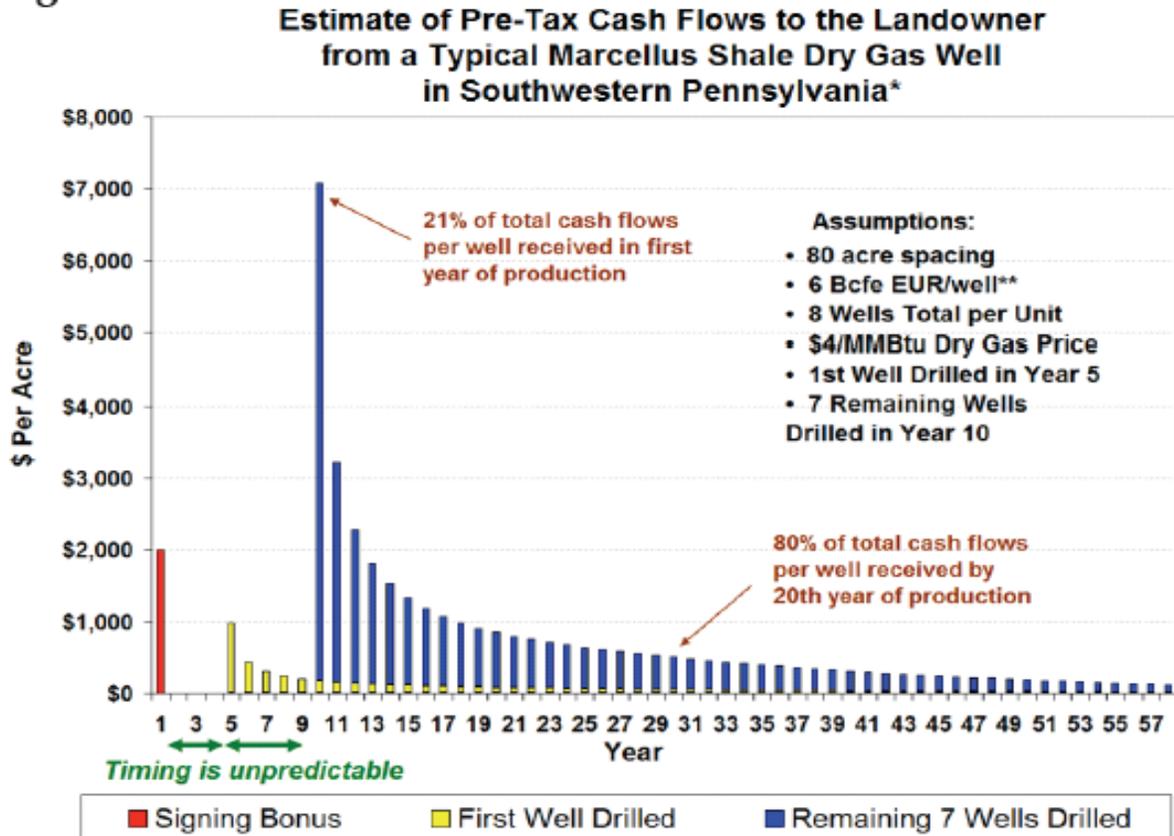
As you can see from Figure 1, the bonus money paid at lease signing is modest compared to the royalties that will be generated by gas production.



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As you can see from Figure 2, the timing of royalty checks is unpredictable; they'll come, but not necessarily in the immediate future:

**Figure 2**



\* Typical Marcellus Shale dry gas well pad in SW Pennsylvania as of 8/1/13

\*\* EUR = Estimated Ultimate Recovery

After a bit of research, we learned that the signing bonus and the royalties are all treated as normal income for tax purposes, and taxed in the year in which they are received. The drilling company, however, does not withhold any portion of the payments for taxes. That means the landowner must put aside about a third of any payment he receives to pay the taxes, (and avoid getting caught short at tax time), and ought to look into paying estimated taxes to avoid penalties. The cash flows are also large enough that the landowner might want to think past the new tractor or kitchen remodel, and start thinking about how to put that money to work over the long term.



## Considerations for Figures 1 and 2—Estimating Royalties per Acre:

*Oil & Gas (O&G) companies estimate total gas yields over the life of their Marcellus wells to be about 6 billion cubic feet equivalent. We are assuming that natural gas prices remain at \$4/ thousand cubic feet (mcf) for the life of the well. Therefore, total revenues per well are \$24 million; 6,000,000 mcfe x \$4/mcf market price = \$24 million. (Note the conversion from billion to thousand cubic feet equivalent.)*

*O&G companies estimate that 15% of gross revenues will be paid in marketing and transportation fees; therefore, royalties less expenses equal \$20.4 million: \$24 million – (\$24 million(.15)) = \$20.4 million.*

*Most O&G companies are granting at least 15% royalties to the landowner; therefore, total royalties per well are equal to \$3.06 million; 15% X \$20.4 million = \$3.06 million.*

*O&G companies assume a well spacing of 80 acres, and it looks to us like the units they are putting together are about 640 acres in size. To hold the leases on a unit of 640 acres, they need to drill one well in the unit. To calculate royalties on the “lease holding well,” we’ve divided \$3.06 million by the 640 acres in the unit, resulting in \$4,781/acre.*

*To fully develop the unit, the O&G company would need to drill seven more wells. So, \$3.06 million x 7 wells, divided by 640 acres, results in \$33,469/acre for the “production wells.” The royalty curves on this chart illustrate an approximate distribution of pre-tax cash flows over time. Approximately 21% of the total gas output of a well is realized during the first year and 80% by year 20. A well’s life may exceed 50 years.*

*The comments made by Ron Muhlenkamp are his opinion and are not intended to be investment advice or a forecast of future events.*

